Is There Regional Variation in Great Horned Owl Recovery Rates Within Saskatchewan?

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INTRODUCTION

In Saskatchewan, 6615 nestling or local Great Horned Owls *(Bubo virginianus)* have been banded through 1992; recoveries have been made of 493 birds through 31 March 1996. The size of this data set allowed me to undertake an exploratory test of possible non-homogeneity in recovery rates between different banding areas in Saskatchewan. Based on casual observation as band recoveries came in, I hypothesized that low recovery rates might occur in more wooded areas with the best habitat and that higher recovery rates might occur in open areas and near cities. My aim was to quantify and explain any such differences. I questioned whether if such results bore up under scrutiny, they would be due to habitat differences and whether they could be differentiated from the effects of small sample size or random chance. I restricted my analysis to those 10-minute blocks in which 30 or more owls had been banded. I then lumped groups of blocks with similar habitat (degree of woodedness) to obtain categories with larger sample sizes. I also made comparisons between blocks with high recovery rates and those with low recovery rates. Two final questions were whether recoveries in the United States tended to come from blocks closest to the United States-Canada boundary, and whether there was any intra-province variation in brood size. I am not aware that such questions have been tested previously for a non-game species.

METHODS

My data set consists of 6615 Great Horned Owls banded as nestlings or local birds; 6478 of these had been banded in 2926 nests (2.21 per successful nest). An additional 137 fledglings were banded out of the nest so that the size of their brood (number of siblings) was unavailable. Banding occurred in 486 different 10-degree blocks of latitude and longitude.

I analysed in greater detail the 57 blocks where between 30 and 305 owls had been banded in each. These accounted for 3881 (58.7%) of the 6615 owls banded and 286 (58.0%) of the 493 recoveries.The degree of woodedness was subjectively determined for each one minute block as the proportion of "green" area represented on 1:250,000 topographic maps (National Topographic Survey, Canada), at the beginning of the study.

RESULTS

There were 493 recoveries (7.5%) through the end of 1995. The 57 10-minute blocks, each with 30 or more bandings, had an overall recovery rate of 7.5%. Seventy-two recoveries, including 50 from 33 banding blocks under closer scrutiny, occurred in the United States.

1) Highest number banded: The Strasbourg (510-1045; 305 owls banded) and Yellow Creek (524-1051; 250 banded) blocks were the blocks with the highest number of young banded. Both blocks were heavi ly wooded with high densities of aspen and/or black poplar and had recovery rates of 2.6% and 4.0%, respectively.

2) Wooded versus open areas: In 27 blocks with less than 5% wooded cover, the recovery rate was 8.1% (130 of 1612); in 21 blocks with cover of 5 - 25%, the rate was 7.9% (124 of 1573); in 4 blocks with 25-50% cover, the rate was 6.1% (22 of 361); in 5 blocks with over 50% cover, the rate dropped to 3.9% (31 of 788). Sample sizes for the last two groups are too small to allow testing, but the trend was in the direction of lower recovery rates from banding in more densely wooded blocks.

3) High and low recovery rate areas: To obtain more robust and more equal groupings, I analysed 14 blocks with less than 5% recovery rate, 28 with 5-10% rate, and 15 with over 10% rate. I looked at the timing and location of recoveries in each of these three groups.

a) In 15 blocks with 5% or less recovery rate, 61.0% (25 of 41) were recovered in the first year after banding (16 locally and 9 at a distance, and 39.0% (16 of 41) in subsequent years.

b) In 27 blocks with recovery rates of between 5 and 10%, 58.5% (72 of 123) were recovered in the first year (44 locally and another 28 more distant), and 41.5% (51 of 123) in following years.

c) In 15 blocks with high recovery rates over 10%, 64.8% (79 of 122) were recovered in the first year (57 locally and 22 at a distance), and 35.2% (43 of 122) in subsequent years. These blocks tended to be either near cities or in open country with less habitat cover.

4) The percentage of recoveries within the United States was widely and fairly evenly distributed over all banding blocks. As a result, the percentage was inversely proportional to the recovery rate: 27.6% (16 of 58) of recoveries for owls banded in the seven blocks with the greatest number of owls banded, 24.4% (30 of 123) for those banded in blocks with recovery rates or 5 to 10%, and only 9.8% (12 of 122) of those banded in blocks with recovery rates over 10% went to the United States.

5) Brood size: There was no consistent variation in brood size between different 10-minute blocks. Brood size for these 57 blocks ranged between 1.8 and 2.5 young per successful nest, with a mean of 2.2. Of interest, with large sample sizes, for the nine blocks in which over 100 owls were banded, brood size was always 2.2 or more. Brood sizes of four were found in only 27 blocks.

DISCUSSION

Differences in recovery rates between blocks show suggestive if not conclusive trends. Low overall owl recovery rates from more heavily wooded areas could be explained in part by lower human population, with subsequently less chance of a person happening on a dead or injured owl; we postulate that the owl carcass might also be less conspicuous in good tree cover. Better cover might also enhance owl protection; and at the peak of the snowshoe hare cycle, there would be more snowshoe hares for food. Conversely, in open county, any dead owl is more visible and more likely to be found and reported. Near cities there are more people to find and report dead owls.

Blocks with the highest recovery rates had more owls die in the first year near the site of banding. Owls raised farthest from the United States boundary seemed just as likely as those farther south to be recovered in the United States. Although the number of owls banded in the studied blocks was appreciable, the number of owls recovered per block proved too small a sample to show statistically significant differences.

SUMMARY

From 6615 Great Horned Owls banded in 486 different 10-minute blocks of latitude and longitude in Saskatchewan, 57 blocks contained from 30 to 305 nestling Great Horned Owls. The two blocks with the most young banded were both in wooded areas, and had recovery rates of 2.6% and 4.0% (vs. an overall mean of 7.5%). Low recovery rates from these two blocks might be explained in part by lower human density, hence less chance of a person happening on a dead or injured owl. Better cover might make a carcass less conspicuous, enhance owl protection; and at the peak of the snowshoe hare cycle, provide more hares for food. In contrast, fifteen banding blocks with high recovery rates (>10%) tended to be either near cities, with denser human population increasing the chance of a dead owl being found; or in open country with less habitat cover, where any owl carcass would be more conspicuous. Band recoveries are affected by many variables and tend not to be homogeneous. Brood size showed little variation between blocks.